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GROUP AGENCY AND EPISTEMIC DEPENDENCY

AARON DEWITT
adewitt@dal.ca

ABSTRACT

Modern epistemic questions have largely been focused around the individual and her ability to acquire knowledge autonomously. More recently epistemologists have begun to look more broadly in providing accounts of knowledge by considering its social context, where the individual depends on others for true beliefs. Hardwig explains the effect of this shift starkly, arguing that to reject epistemic dependency is to deny certain true beliefs widely held throughout society and, more specifically, it is to deny that science and scholarship can provide true belief. Alternatively, Hardwig argues that beliefs could be granted to communities or groups but denied to individuals. This paper approaches these broad assertions using a group agency model from List and Pettit. Through a discussion of the 'epistemic desideratum' of group agents, I conclude that List and Pettit give us reason to accept some of Hardwig's concerns, but that attributing beliefs to groups does not require us to deny them to individuals, rather an individual can use a group agent as a source of epistemic dependence.

The field of social epistemology explores epistemic mechanisms that extend beyond the individual. Goldman (2009) notes that, although since Descartes there have been some forays into social considerations related to epistemic issues (specifically dealing with testimony), they have been few in number and have had comparatively little impact on directing the questions and interests of epistemologists. Philosophy arrived late on the contemporary scene with regard to investigating the nature of knowledge in the context of a social group (cf. Knorr Cetina 2007). John Hardwig (1985) raises important concerns regarding the basis of the formation of rational beliefs in both individuals and groups. Hardwig takes a suspicious view of the possibility for epistemic autonomy, an inheritance from the Enlightenment, and considers the issue from the perspective of intellectual authority and the relationship between expertise and evidence for beliefs.

Hardwig argues for two possible and seemingly mutually exclusive conclusions in his paper. The first is that to reject epistemic dependency is to deny the rationality of certain true beliefs widely held throughout society and, more specifically, it is to deny that science and scholarship can provide rational beliefs. Hardwig's alternative conclusion, which he finds 'disturbing', is to grant rational beliefs to communities but that such a community 'is not reducible to a class of individuals, for no one individual and no one individually knows that [some proposition] p' (Hardwig 1985: 349).

In this paper I will demonstrate that the tensions found in Hardwig's conclusions can be constructively approached using a theory of group agency, specifically that proposed by Christian List and Philip Pettit (2011). List and Pettit seek to elucidate both philosophical

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and pragmatic issues concerning group agency. In the initial component of their discussion of the organizational design of group agents, List and Pettit examine what they call the 'epistemic desideratum', a determination of how a group agent can optimise its ability to form rational true beliefs of the world (List and Pettit 2011: ch. 4). According to the authors, group agents ought to be able to form true beliefs and do so reliably and according to reason. By applying List and Pettit's view of group agency and particularly their discussion of the epistemic desideratum of group agents, I will consider the strength of Hardwig's conclusions. I will begin by framing the problems inherent in epistemic dependence as argued by Hardwig. Then I will discuss List and Pettit's account of group agency and how groups can optimise their ability to make true and rational judgments. Next, I will bring Hardwig's concerns to bear on this account. Finally, the relationship between group agency and Hardwig's conclusions will be established. I will conclude that List and Pettit give us reason to accept some of Hardwig's concerns, but that attributing rational beliefs to groups does *not* require us to deny them to individuals; rather, an individual can use a group agent as a source of epistemic dependence.

EPISTEMIC DEPENDENCY

The primary concern in Hardwig's paper is the commonplace epistemic state of holding beliefs without possessing evidence for them. At the outset it seems that in believing a proposition without evidence the belief is irrationally or non-rationally held. He writes that '[t]hough I can readily imagine what I would have to do to obtain the evidence that would support any one of my beliefs, I cannot imagine being able to do this for all of my beliefs. I believe too much; there is too much relevant evidence (much of it available only after extensive, specialised training); intellect is too small and life too short' (Hardwig 1985: 335). However, Hardwig argues that a 'good reason' for believing that 'p' need not be evidence-based, but can result from having a good reason to believe that others have good reasons to believe that 'p'. This, asserts Hardwig, has strong implications for the nature of rationality and the wider pursuit of knowledge.

Hardwig's argument relies upon the relationship between the layman and the expert. Expert A believes 'p', having gained evidence from enquiry. Layman B does not have evidence for 'p', but he does have evidence that A ought to be believed when stating her belief of 'p'. If this is the case, then for Hardwig, B's belief that 'p' can be based on that of A. The case of the layman–expert relationship, as opposed to that of a more general sense of trust (cf. Hardwig 1991; Foley 2005), is built on the 'layman's appeal to the intellectual authority of the expert, his epistemic dependence on the expert, and his intellectual inferiority to the expert (in matters on which the expert is expert)' (Hardwig 1985: 338). Further, it is possible that the layman is incapable of understanding the expert's reasons for holding 'p' to be true or understanding why they are appropriate. Even obtaining evidence that an expert is in fact an expert can be beyond the layman's ken. A's expertise may be outside of B's reach for reasons related to time, resources and sheer ability and competence. It seems that B's belief on the grounds of A's belief is not rational, but appears based on faith rather than 'good reason'.

Yet Hardwig argues that we must accept B's belief as rationally justified or risk classifying most beliefs held within complex social structures as not rational. Epistemic dependence is unavoidable, and for it to be eschewed an individual would for the most part

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hold solely uninformed, unrefined, untested, unreliable and therefore, for Hardwig, irrational beliefs (1985: 340). A layman then cannot rationally refuse to defer to the beliefs of an acknowledged expert.

Hardwig extends his argument beyond the layman–expert relationship into the field of scholarship. Advancement in research relies on epistemic dependence: a scientist does not (and cannot, temporally and perhaps competently speaking) repeat all the studies on which her own research is based in order to achieve epistemic autonomy (ibid., p. 345). Within a field of knowledge, experts take on a role similar to the layman. To illustrate this, Hardwig considers research in particle physics: many sub-experts within the field are required to run and perform the analysis on a single experiment. Time constraints and the specificity of expertise required make this dependency unavoidable (ibid., p. 347). When research is uncovered as fraudulent, the individual must acknowledge the extent to which her research relies on that of others and must respond to the greater lay community regarding the status of perceived expertise (ibid.).

Kusch (2002) understands Hardwig to be presenting three alternative possibilities of how the distribution of knowledge can be interpreted. Kusch labels them 'strict individualism', 'relaxed individualism' and 'communitarianism', and considers how each stance accounts for who may be said to hold the conclusions of a highly collaborative research project. The strict individualist must deny that anyone reasonably knows the results of such a project, insisting that solely an individual can possess knowledge and does so only when she has the requisite evidence 'on-board'. The relaxed individualist will allow the individual to know vicariously without possessing the evidence for what he knows and perhaps without understanding the evidence of what is known. Finally, the communitarian will view the whole community of physicists as the knower. Kusch notes that '[c]ommunitarianism allows us to retain the idea that a knower must be in 'direct' possession of the evidence but it breaks with the assumption that such a knower must be, or can be, an individual' (Kusch 2002: 49). The worry motivating Hardwig's argument is that much of epistemology is rife with a subtext of 'epistemic individualism', which has repercussions for how we approach knowledge, the knowing agent and rationality. Hardwig seems to be advocating the communitarian stance and is certainly somewhere on the spectrum between communitarianism and relaxed individualism. Allowing an aggregate of people to count as a single epistemic subject (at least in certain instances) may break with the long-held individualist tradition but retains the intuition that knowers must have all the evidence necessary for their knowledge. Relaxed individualism meanwhile maintains the individualist status quo while denying the need for the knower to have obtained directly the necessary evidence for his knowledge (cf. Kusch 2002: 50). Thus Hardwig provides two possible conclusions. The first is that propositions can be rationally believed even through great chains of epistemic dependence. This conclusion, writes Hardwig, may be difficult for the traditional epistemologist to accept as it does not require us to understand 'p' and possess evidence for 'p' being true. Hardwig's alternative is to treat a community, not reducible to a set of individuals, as the bearer of true belief and to deny it to the individual, avoiding the first conclusion's bitter pill. Yet Hardwig sees the second conclusion as a possible threat to key Western philosophical principles that uphold individuality; he writes that it 'reveals the extent to which even our rationality rests on trust and . . . threatens some of our most cherished values – individual autonomy and responsibility, equality and democracy' (Hardwig 1985: 349). Hardwig resists exploring this last idea further, and I shall do so as well.

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GROUP AGENCY

List and Pettit provide significant insight into the intricacies of group agency. I will begin this section by providing a brief summary of what constitutes agency for List and Pettit and how the requirements of agency can be satisfied by a group. I will then consider how a group agent can consistently form rational true beliefs, an explanation of which, as we will see, is crucial in constructively approaching the gauntlet laid down by Hardwig.

According to List and Pettit, agents have three functionally substantiated features. They have states that represent their environment ('beliefs'), states that motivate how aspects of the environment ought to be ('desires'), and they have the ability, in appropriate conditions, to intervene in the environment according to their representations and motivations ('the ability to act') (List and Pettit 2011: ch. 1). Representational and motivational states consist of attitudes that have propositional objects. A proposition that is the object of an affirmative representational attitude is believed to be true by the agent, and a proposition that is the object of an affirmative motivational attitude is one which the agent is motivated to make true through its actions (ibid.: ch. 1).

Propositional attitudes can be binary or non-binary. If an agent holds a binary representational attitude towards a proposition 'p', for example, then he or she judges (or does not judge) that 'p'. An example of a non-binary attitude is a credence or probabilistic degree of belief (ibid.: ch. 1, p. 9).

The propositions towards which attitudes are held can also come in different forms. Propositions can range from the most basic ones, like 'p', to compounds such as those expressed in propositional logic, for instance 'not p and q'. Propositions can be expanded to include modalities, such as 'it is necessary, or possible, that p', and further to create meta-linguistic expressions allowing agents to have attitudes towards other propositions, like '"p" is true' and '"p" is consistent with "q"' (ibid.: ch. 1, p. 10).

The third feature of agency, concerned with performance, overarches List and Pettit's 'standards of rationality', of which there are three (ibid.: ch. 1, p. 7). 'Attitude-to-fact' standards favor representations that match the true state of the world and reject representations that fail to do so. 'Attitude-to-action' standards ensure that actions taken are within the domain of what is defined by the agent's representational and motivational states. Finally, 'attitude-to-attitude' standards ensure a consistency between attitudes to avoid problems such as contradiction (ibid.: ch. 1).

Not all agents have access to the most complex propositions and, in turn, cannot apply the standards of rationality to a wide range of propositional types. Humans, however, not only apply the standards to meta-linguistic propositions but can do so in order to check the functioning of these standards. For instance, while the attitude-to-attitude standard more or less automatically processes representational and motivational states to promote consistency between attitudes, an agent may have the explicit desire – the motivational attitude – that 'p' and 'q' are consistent. The ability to form attitudes towards meta-language propositions to check one's rational performance, for List and Pettit, constitutes 'reasoning' (2011: ch. 1, pp. 30–1).

List and Pettit's functionalist explanation of the necessary aspects of agency allows them to be flexible in considering what constitutes an agent, thereby providing the opportunity to explore a more 'radical' form of social epistemology (List 2005). This is the basis of their book's aim: to argue for and demonstrate the validity of group agency. Simply, a group that fulfills the above features of agency constitutes a group agent. Group agents

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can be composed in many different ways. They can be formed with or without intent and can form representational and motivational states through many methods and perform processes upon these states through a variety of means (List and Pettit 2011: chs 1–3).

For the purposes of this paper, I am mostly concerned with the ability of group agents to rationally form true beliefs of the world. A group agent should be able to form true beliefs reliably. A powerful and plausible enough model of obtaining rational true beliefs reliably will shed light on Hardwig's two concerns regarding epistemic dependency: that propositions can be rationally believed despite considerable epistemic chains of dependence and that treating a community as the bearer of rational true belief denies it to the individual. Attaining the high degree of reliability is what List and Pettit refer to as the 'epistemic desideratum' (2011: ch. 4).

An aspect of reliability is the concept of 'truth-tracking'. An agent tracks the truth when it judges that 'p' if 'p' is true ('positive tracking') and does not judge that 'p' when 'p' is false ('negative tracking') (ibid.: ch. 4, p. 2). Since agents are generally if not universally imperfect, both conditionals tend to be only partially satisfied, and thus agents can have varying degrees of positive and negative reliability. A high tracking reliability (both positive and negative) is important for a well-functioning agent.

List and Pettit assert that members of a jointly intentional group agent would likely seek their group reason by ensuring that their group's judgments track the truth. This might be accomplished by aligning the group's judgments with those of its most reliable members. However, List and Pettit invoke 'the law of large numbers', describing the trend that the truth-tracking reliability based upon pooled information of a group can exceed that of each individual member. In order to take advantage of this statistical phenomenon, group agents must form organisational structures that appropriately facilitate information pooling (2011: ch. 4, pp. 7–8). How can the judgments of the group agent's constituents be adequately aggregated into a group judgment?

According to the Condorcet jury theorem, so long as group members each have positive and negative tracking reliabilities above 50 percent (but typically below perfect, a requirement known as the 'competence condition'), and the judgments of group members are independent of one another (a requirement known as the 'independence condition'), the probability of a majority of group members making a correct judgment is higher than the chance of an individual making a correct judgment (List and Pettit 2011: ch. 4, pp. 8–11).

Like the expert who can be depended upon to provide evidence only for the knowledge in the area she is specialised in, it is likely that group members will not satisfy the competence condition with respect to every proposition, or at the very least their tracking abilities will vary greatly. With this in mind, List and Pettit suggest a 'distributed premise-based procedure' (2011: ch. 2, p. 20, ch. 4, pp. 16–17; List 2005). In this kind of organisational structure, propositions on which attitudes are formed are designated as premises and conclusions. When priority is given to the premises, a group attitude is taken on each premise, the results of which determine the group attitude on the conclusion (List and Pettit 2011: ch. 2, p. 19). This procedure becomes 'distributed' when group members are subdivided as specialists on a specific premise-proposition on which they alone, by majority vote, determine the group agent's attitude (ibid.: ch. 2, p. 20, ch. 4, p. 17), thereby optimally using their expertise.

Threats to the independence condition are not as easily resolved. In the ideal case where the independence condition is fulfilled, along with the competence condition, the truth-tracking ability of a group steadily approaches one as new group members are

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added. When the fulfillment of the independence condition varies, it is more difficult to ensure that the theorem applies. Yet depending on the group, attempts can be made at optimising the condition (cf. ibid.: ch. 4, p. 26). I will return to the independence condition in my discussion further along in the paper.[1]

Before moving on, it should be mentioned that others have also argued for, created models, and done empirical research demonstrating the ability of groups to outperform individuals in problem-solving and forming accurate predictions. For instance, Page builds an argument around the hypothesis that '[d]iversity leads to better outcomes' (2007: 4); that is, that groups of people with different ways of characterising, approaching and solving problems create benefits for the group. A problem's solvability is partially determined by how that problem is represented (Page 2007: 44). Varied interpretations of representations also add to diverse possible approaches in seeking solutions, as do applying different possible heuristics (Page 2007: 54, 79).

Indeed, Page's models demonstrate that the best problem-solvers in a group tend to approach problems similarly and in so doing fare no better as a group than they would as individuals, while a group of capable yet random problem-solvers is collectively better than any one member. In Page's words, 'diversity trumps ability' (2007: 137). This finding, however, relies on certain constraints. There must be a certain amount of diversity among members in a group, the groups had to be of a relatively large size (dependent on the difficulty of the problem and the diversity of the problem-solvers), the tasked problem had to be difficult and the group members had to have a certain degree of intelligence (Page 2007: 137, 158).

GROUP AGENCY AND THE ISSUE OF EPISTEMIC DEPENDENCY

Why should we consider List and Pettit's discussion of group agency as germane to Hardwig's picture of the problems with epistemic dependency? Hardwig's concerns are based in part on what we are willing to allow as 'good reasons' for knowledge, and his primary illustration of his problematic conclusions is knowledge within a community of 'knowers' (the community of expert-physicists with its membership of sub-experts and consequently lay-physicists), which mirrors the familiar relationship between laypeople and experts. For List and Pettit's arguments to help address Hardwig's worries, we must consider whether a community of physicists or any similar collective can properly constitute a group agent. I am inclined to argue that it can. A community of specialists such as physicists fulfills the three features of agency. As a field, physics has representational attitudes, beliefs on the state of its environment gained through observation and experimentation. It has motivational attitudes, holding desires of how the environment ought to be in terms of submitting and evaluating hypotheses about the world and its features, as well as in a more practical sense, when concerned with funding, education and research. Finally, the community has the capacity to process these states leading to interventions in a multitude of forms. While there are debates within the field

1 List and Pettit consider these and other organisational models under varying yet specific conditions. The number of group members, their individual truth-tracking abilities, the relevant propositions and the way in which the propositions are formed into premises all impact on the appropriateness of the group's organisation (2011: ch. 4, p. 26).

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regarding aspects of these features, this self-evaluative nature demonstrates the third feature of agency: rationality and reasoning. The formation of scientific models and testing of hypotheses and the creation of theories correspond to List and Pettit's three standards of rationality in determining what in nature corresponds, or is contrary to, the field of physics' representations of the world, ensuring that actions are within the domain of its understanding of reality and searching for consistency between various representations and investigating any inconsistencies. Furthermore, physics and other scholarly pursuits constitute a group agent with joint intention, a criterion that List and Pettit hold as central to the bulk of their explanations and intuitions on group agency. While there is no explicit affirmation of joint intention, communities of scholars and scientists are aware that they share goals, contribute towards those goals and join in the pursuit of knowledge with the belief that others are doing the same (List and Pettit 2011: ch. 1, p. 19).

Moreover, consistent with Condorcet's competence condition, the distributed premise-based procedure is a good, though clearly idealised, representation of scholarship, with attitudes on premises determined by experts allowing the group to exceed its members in truth-tracking ability. The independence condition, by contrast, is the more difficult problem for belief aggregation. How can members of a single community be expected to hold mutually independent judgments? The independence condition relies on a non-correlation between individual judgments. Relatively mild interdependencies, such as an individual relying in part on his own private information and partially on information obtained from others, do not necessarily violate the independence condition but may affect the degree to which the reliability of the group exceeds that of its constituent individuals. For Condorcet's original independence condition, individuals' judgments are independent when they are 'separate causal descendents of the truth of the matter' about a proposition (ibid, p. 106). List and Pettit, following Dietrich and List (2004), introduce the scenario of an intermediate shared body of evidence about the truth of a proposition, such as the shared evidence available to an expert panel or a jury, on which the individual judgments depend. In this case only a conditional sense of independence is satisfied; the individuals are independent – at most – conditional on the evidence. In the truth-tracking model, this conditional independence constraint differs from the original constraint in that while the group's truth-tracking ability continues to exceed that of its members, it is bound by a threshold level of reliability below one, namely the probability that the evidence is not misleading.

To show that the scientific and wider academic communities, though exceedingly more complex than the juries of the Condorcetian models, have degrees of conditional independence is well beyond the scope of this paper. However, since even the conditional independence condition results in a higher truth-tracking value, I *will* argue that this provides sufficiently optimistic grounds to accept the aggregation model suggested by List and Pettit as an idealised representation of science.

Hardwig's 'good reason' finds its analog within List and Pettit's concept of 'truth-indication'. An agent that forms beliefs on the basis of an expert's beliefs requires evidence that the so-called expert is in fact just that. For List and Pettit, a good truth-indicator 'has the property that the truth-value of "p" co-varies with the agent's judgment on "p"' (2011: ch. 4). For example, we expect a good diagnostic test in medicine to be a truth-indicator in this sense. So, can a layman take an expert's judgment as a truth-indicator? For the layman, ascertaining whether a truth-value *does* in fact co-vary with a judgment may lead to another string of epistemic dependencies. This is

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Hardwig's point: obtaining epistemic autonomy in most cases is impractical if not impossible – though many theorists do not see this issue in such stark terms (see Goldman 2001; Siegel 1988; Faulkner 2002). However, truth-indication and truth-tracking give other agents non-binary information regarding an agent's reliability. An agent's skill at making true judgments can be measured on a scale of probability, something Hardwig does not raise or seemingly consider.

RESOLVING THE CONCLUSIONS

After examining the relationship between List and Pettit's explanation of the epistemic desideratum of group agents and Hardwig's wider epistemological concerns, does the List and Pettit model provide a helpful approach to Hardwig's two possible conclusions? While List and Pettit do not explicitly address Hardwig's initial conclusion regarding rationally holding beliefs without direct evidence, they note that an agent's level of truth-indication translates into a degree of reasonably held belief that an outside observer can rationally assign to 'p' after the agent in question has judged that 'p' (List and Pettit 2011: ch. 4). Ideally, a degree of belief in this case can be Hardwig's 'good reason'. Layman (meaning a single layperson or a group of laypeople) B's evidence that Expert (perhaps a single expert or a community of experts) A ought to be believed can support a high degree of belief, allowing B to rationally hold 'p' to be true when A holds 'p' to be true, or whatever the case may be. In addressing the reliability of an agent's truth-indication and its possible impact on outside observers, List and Pettit acknowledge that epistemic dependence exists and they provide a pragmatic model for integrating it into the wider understanding of the epistemic aspect of an agent in the form of truth-indication and tracking.

Returning to Kusch's characterisation of Hardwig's models of the distribution of knowledge, List and Pettit's approach seems to support 'relaxed individualism'. B gets to know that 'p' through A's endorsement that 'p' by virtue of A's reliable truth-indication: B need not hold the (direct) evidence for 'p', as strict individualism requires, and similarly knowing 'p' can be attributed to B, whether B is a group agent or an individual. Hardwig's more radical conclusion, ascribing rationally held true beliefs to a group agent that cannot be reduced to individuals, is not a conclusion for List and Pettit. Instead they draw a more moderate conclusion. They maintain that a group agent's truth-tracking ability can, with the appropriate organisational structure, exceed that of its constituents (see above and List 2005). Through organising in a structure subdivided by expertise, a group agent has a higher probability of judging propositions correctly than the individual: group agents can be more likely to rationally form true beliefs than individuals. It is not surprising for List and Pettit that we can acknowledge that a community can form rational beliefs with a higher consistency of truth than an individual, yet I do not think they would deny rational belief to the individual. Under the right conditions, a group is more likely to hold reliable rational true beliefs than an individual, and this can be judged by an outside agent. An agent's degree of truth-tracking is a sign of expertise and one agent ought to defer to another with a higher tracking ability: it is *reasonable* to do so. Thus while Hardwig's concerns are pertinent, List and Pettit's account gives model solutions for his conclusions.

Yet what are the benefits of the agential aspect of List and Pettit's argument? If the community of physicists, or Science, or any group of experts on which we rely for

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knowledge, fails to attain the functional features of agency, is the whole project lost? Models of aggregation and truth-tracking could still apply to groups regardless of their agency. Yet it is the component of agency that provides both a reason and explanation for how many groups are treated. This is an aspect of the intuition that drives Hardwig's concerns. Part of parsing knowledge is understanding how it is formed and the nature of whomever or perhaps whatever forms it. As the creation of knowledge becomes an evermore complex interpersonal project, delineating contributions becomes increasingly difficult and perhaps even irrelevant (cf. Page 2007: 167–70). An epistemic agent, in representing the world, acting upon the world, and using reason to form judgments about the world, also seeks these features in the sources on which it is epistemically dependent in order to judge its source. As we have seen this is not necessarily incorrect, nor does it require epistemic individualism.

If anything, using social choice theory, as List (2008) suggests, to provide 'a general theory of the aggregation of multiple (individual) inputs into single (collective) outputs', helps to elucidate the structure of knowledge-producing groups. This is considered by some to be a central aspect of social epistemology (cf. Goldman 2009). Knorr Cetina (2007) argues that in particle physics experiments, epistemic agency can be attributed variously to the collaborators: solely to the experimenters and to the experiment as a whole – collaborators and apparatus. A shifting focus between epistemic agents, from the individual to the whole and the aggregates in-between can, in the right conditions, be accounted for by List and Pettit and might relax Hardwig's worries. Yet Giere (2006) is reluctant to assign epistemic agency to a whole distributed cognitive system, arguing that only the human elements of such a system deserve the attribution of agency. Though epistemic issues that exist in the relationship between systemic distributed cognition and group agents are not brought to bear directly in this paper, they are significant in both the realm of social epistemology, distributed cognition and even the extended mind hypothesis. While aggregation techniques may vary within a group depending on its goals, as we saw above List and Pettit are willing to attribute agency to anything that can fulfill their criteria. Indeed, applying theories of agency have added benefits beyond clarifying epistemic status: Giere (2009) argues that connecting abstract scientific models to the specific worldly systems they are meant to represent requires us to regard the originator of a model as an agent. In order to determine the intent behind the model, we must attribute agency behind its creation. Recent discussion in popular discourse regarding 'Science' and scientific communities makes broad claims on the methods, goals and responsibilities of Science, characterising the field either to defend it from those who seek to discredit scientific conclusions or to encourage doubt among laypeople regarding the scientific process and scientists themselves (see Oreskes and Conway 2010). Methodological consideration of agential concerns of groups in general and of scholarly and academic fields in particular are not simply issues of philosophical relevance or interest but are in the day-to-day interests of contemporary society.

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AARON DEWITT is interested in the interaction between science and philosophy, cognitive science and embodied and embedded cognition. Currently a JD student at the Schulich School of Law, Dalhousie University, he is also interested in how psychological evidence is treated by legal systems.

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